INVERMERE

FOREST DISTRICT

Enhanced Forest Management Pilot Project

Business Plan
for
2002/03

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ENHANCED FOREST MANAGEMENT PILOT PROJECT

Business Plan for 2002/03

1.0 Background

The Enhanced Forest Management Pilot Project (EFMPP) was initiated in September, 1995 as a co-operative effort between industry, the Ministrys' of Forests and Environment, Forest Renewal BC (FRBC), labour and the academic community. Initiation of the pilot was the main recommendation of a report entitled *A Forest Management Strategy and Action Plan for British Columbia* which was endorsed by the Forest Sector Strategy Committee. Overall, the report determined that there was a need to develop a forest management strategy for the province to;

- address the "falldown" in timber supply as the province makes the transition from unmanaged to managed forests,
- reflect changing public expectations for management of non-timber values (water, habitat, recreation, biodiversity), and
- mitigate the impact of Annual Allowable Cut (AAC) reductions on the forest sector resulting from the Protected Areas Strategy, Timber Supply Review (TSR) and Forest Practices Code (FPC).

In January, 1996 the Invermere Forest District was selected as one of two areas to host an EFMPP by the broadly-based provincial Steering Committee that was established to guide the process. McMillan Bloedel's (now Weyerhaueser) TFL 39 on Vancouver Island was selected as the other provincial pilot area. A third pilot project was initiated in July, 1997 by Babine Forest Products Company in Burns Lake followed by a fourth pilot lead by the Robson Valley Forest District.

The Invermere Forest District formally initiated the pilot project in March, 1996 and following several meetings with the provincial Steering Committee and Technical Advisory Committee (TAC) prepared a project plan in order to clarify the pilot project's scope and deliverables. The main deliverable of the project plan was a *"Management Strategies Report"*, which was released in November, 1998.

Since release of the *Management Strategies Report*, the pilot has been in a reduced mode completing outstanding research projects which were commenced previously to address resource issues or management concerns arising through the pilot.

2.0 Invermere EFMPP Terms of Reference

The following terms of reference, as initially drafted by the provincial Steering Committee and further refined by the Invermere Forest District, provided direction to a locally based EFMPP Working Group which was assembled to undertake the project. A condensed version of the terms of reference is presented in EFMPP Report #1 - *Enhanced Forest Management Pilot Project* which was published by the EFMPP Working Group in November, 1997.

2.1 Pilot Project Goals

The Invermere Forest District EFMPP was to develop enhanced forest management strategies at the forest level which would re-examine the timing, location and intensity of management practices, the application of various harvesting systems and better focus forest inventory and research activities. The goals of the pilot project were to:

- focus FRBC, Ministry of Forests (MOF) and industry expenditures on the forest land base,
- help quantify the benefits of FRBC, MOF and industry funding on the forest land base,
- operationalize the land use objectives and zoning put forward in the Kootenay-Boundary Land Use Plan (KBLUP),
- optimize the management of resource values on the forest land base in consideration of the applicable land use objectives and zoning,
- ensure coordination with the Nelson Forest Region - Annual Allowable Cut Mitigation Strategy,
- empower forest managers to develop a dynamic local forest management strategy with emphasis on increased timber production in suitably zoned areas,
- fully develop the potential short and long-term productivity of the available forest land base within the parameters of existing land use plans and the FPC,
- optimize positive impacts on the community, and
- explore the biological effectiveness, economic efficiency and political realities of employing enhanced forest management strategies.

2.2 Pilot Project Working Group

The Pilot Project Working Group was led by a MOF District Pilot Project Co-ordinator and included local representation from Ministry of Environment, Lands & Parks through the Forest Ecosystem Specialist, the Nelson Forest Region AAC Mitigation Strategy Co-ordinator, a local representative from each of Crestbrook Forest Industries (now Tembec) and Slocan Forest Products, a Technical Advisory Committee (TAC) representative and specified MOF District specialists who were assigned to the project. FRBC was a full Working Group member but participation was limited to an ad hoc basis dependent upon the tasks and issues at hand.

The general public did not participate in the day-to-day operations of the Working Group. The public were accommodated through an extensive array of public involvement and communication initiatives including a Public Advisory Group.

2.3 Reporting Structure

The Pilot Project Working Group was empowered by the provincial Steering Committee and has been supported as requested by the TAC as outlined here and in the TAC terms of reference. The Pilot Project Co-ordinator reports to the provincial Steering Committee providing regular updates on pilot project progress and brings forward issues or decisions required that are beyond the mandate of the Co-ordinator. Six local sub-working groups were struck, the chairs of which provided regular updates at Working Group meetings.

2.4 Communication Requirements

To ensure adequate communication involving the project existed, the Working Group:

- prepared a local "Public Involvement/Communication Plan",
- worked jointly with Nelson Forest Region AAC Mitigation Strategy team and TAC as necessary during management strategy analysis/modelling activities,
- held regular meetings to review progress, address ongoing issues and concerns, ensure discussion occurs on overlapping spheres of interest between sub-working groups, present deliverables, jointly analyse results and provide input into enhanced forest management strategy adopted for implementation, and
- thoroughly and accurately documented all aspects of the pilot project for future reference.

2.5 Project Management

In order to ensure pilot project coordination and focus, the Working Group:

- established a project management plan at the outset of the pilot project which included timelines, resources required, delineation of the pilot study area, project deliverables, sources of funding, required operational plan revisions, and status of the Working Group over time,
- assigned sub-working groups to develop alternative forest land management scenarios by focusing on the specific management issues and considerations, and
- committed to establishing a monitoring process to regularly evaluate results achieved against the enhanced forest management strategy and objectives over the long-term.

2.6 EFMPP Study Area

The "White/Lussier River" drainage serves as the study area for the project. The selection of the White/Lussier River drainage was made following a District assessment of three candidate study areas against a series of predefined selection criteria. The White/Lussier River area best met the criteria that were established. A separate report is available which discusses the selection criteria.

The White/Lussier EFMPP study area encompasses approximately 20 percent of the Invermere TSA and is located in a drainage that supports a wide variety of resource activities. Both of the District's major licensees, as well as the Small Business Forest Enterprise Program (SBFEP) have active harvesting operations within the area. A diversity of physical attributes exists ranging from low elevation native grasslands to high elevation bare rock and tundra. The tree species and age classes are also diverse though a significant portion of the area was affected by three major fires that occurred in 1985.

Table 1 provides an indication of the extent of the landbase that is included in the EFMPP study area.

Table 1. Gross Area (ha) of White/Lussier EFMPP Study Area

Private	32678
Crown Inoperable	109512
Crown Operable	101566
Interior Douglas-fir	15466
Montane Spruce	21840
Engelmann Spruce Subalpine Fir	58257
Alpine Tundra/Engelmann Spruce Subalpine Fir(dkp)	2788
Other	3215
Gross Area	243756
Gross Area less Private	211078

2.7 Resource Analysis and Modelling

Resource analysis and modelling activities undertaken by the Working Group were designed to:

- ensure accuracy and timeliness of pilot project resource inventory data,
- carry out desired analyses to determine the socio-economic, environmental and timber supply impacts at the stand or landscape-level as appropriate to the issue or management strategy/principle being assessed in the pilot study area,
- ensure that the enhanced forest management strategies modelled were carried out within the framework of the FPC and KBLUP, and
- develop 'feedback loops' and continuous running of alternative harvest projections to analyse the various management strategies of the project.

2.8 Project Deliverables

The pilot project deliverables included:

- a detailed "Pilot Project Management Strategies Report" which was submitted to the provincial Steering Committee in November, 1998 which outlined the: management strategies adopted for implementation in the pilot study area; a 'picture' of the forest estate (both timber and habitat) in the pilot study area in five year increments; socio-economic, environmental, and wood supply

analyses of the strategies; and, recommendations for changes to policy, procedures and legislation to facilitate provincial implementation, and

- "Pilot Project Progress Reports" submitted to the provincial Steering Committee at each meeting that identify: any proposed changes to ongoing management strategies in accordance with the principles of adaptive management, successes/failures, and the results of completed and ongoing research activities.

3.0 Public Communication and Involvement

3.1 Background

A critical component of the EFMPP was to ensure there were opportunities to involve local residents in a meaningful way and to adequately communicate the activities surrounding the pilot project in an open manner. Support from the general public was considered an essential element in achieving long-term success with the forest management strategies and principles that have been adopted for the pilot and ultimately *may* be applied across the Invermere Forest District as a whole.

Because of the timeframes established for the pilot project and the technical complexity surrounding the modelling and analysis activities, the general public was not expected to participate in the day to day functioning of the EFMPP Working Group. However, formation of a Public Advisory Group (PAG) enabled the public at large and members of East Kootenay interest groups to input concerns, advice and recommendations on an ongoing basis to the Working Group in a structure more suited to their availability.

In addition to the PAG, a Public Involvement/Communications Plan was prepared and implemented at the onset of the pilot which established other mechanisms to involve and communicate with the local communities using a variety of different avenues. These avenues were comprised of public presentations and information sessions, newspaper articles and provision of opportunities to actively participate in operational activities occurring in the pilot study area. In recognition of the pilot project's long term educational and cultural implications, the plan also provided for extension activities to the local school district and support extension to forestry practitioners outside the District.

3.2 Communication and Involvement Objectives

The broad objectives initially set for public communication and involvement were to;

- maintain open lines of communication with the general public, interest groups, and professional and technical community within the Invermere Forest District that allow for a clear enunciation of the vision, objectives and accomplishments of the EFMPP,
- regularly inform and update the general public through presentations, formal information sessions, news releases, and timely responses to individual inquiries,
- form a Public Advisory Group as a mechanism for ensuring that the public has a opportunity to actively participate in a meaningful way in the activities of the Working Group,
- provide extension opportunities for students in the Rocky Mountain School District through the development of training packages that incorporate computer modelling exercises, organization of field trips and series of guest lectures focusing on the pilot study area, and

- participate in extension opportunities directed at forestry practitioners outside the District.

3.3 Mechanisms Used to Communicate

3.3.1 Public Advisory Group

A PAG was formed to provide a conduit for concerns, recommendations, and advice from the public to the Working Group. Participation on the PAG was open to any interested party or individual. It was established in the fall of 1996 following an introductory newspaper article and a series of presentations to interest groups soliciting volunteers to sit on the group. After release of the *Management Strategies Report*, the PAG disbanded in January, 1999.

Public Advisory Group - Terms of Reference

a. The PAG acted in an advisory not decision making capacity. The PAG was asked to provide recommendations, advice and offer concerns to the Pilot Project Working Group via a Project Facilitator.

b. Submissions put forward by the PAG were considered by the Working Group for inclusion in the pilot project based on their relative technical and practical merits. The Project Facilitator reported to the PAG on the status of submissions made to the Working Group with corresponding decision rationale as required. When possible, Working Group members attended PAG meetings in person to respond to submissions.

c. The PAG sat as an organized group until January, 1999 - the end of the third year of the pilot. Extension beyond was not supported by the group at that time.

d. Members of the PAG were encouraged to participate in escorted field trips and inspections of operational activities within the pilot project study area.

e. PAG meetings were held as issues warranted during non-working hours. Meeting minutes were recorded and made available to PAG members, interested public and the media.

f. Members were encouraged to become actively involved in projects being undertaken within the pilot study area. (i.e. watershed restoration, old growth management)

g. PAG meetings were chaired by the Project Facilitator.

3.3.2 Presentations and Information Sessions

East Kootenay interest groups were contacted during July and August, 1996 to determine their interest in hearing a presentation about the pilot project from the

Pilot Project Co-ordinator and/or Project Facilitator. Interest groups who had a desire to be kept informed of the pilot project's progress were offered a choice of either participating on the PAG or receiving a copy of the minutes from the PAG meetings. Groups contacted represented a wide cross-section of constituencies including those with labour, environmental, municipal, recreational, First Nations and industrial interests.

Information sessions to update the public regarding the vision, objectives, and accomplishments of pilot project have been held annually in conjunction with National Forest Week.

3.3.3 Newspaper Supplements and Articles

A supplement to the local newspaper has been published annually beginning in November, 1996 recounting recent activities occurring in the pilot project. The supplement has been distributed at pilot presentations, by the MOF Executive to other Ministry offices throughout the province, through interest groups and industry in the East Kootenay's community.

Newspaper articles featuring topics of note in the pilot have been submitted regularly to the local print media (*The Valley Echo)* beginning in July, 1996 with an introduction to the pilot. *The Valley Echo* has been solicited to take part in escorted field trips to the pilot project to report on operational activities and to attend PAG meetings.

3.3.4 School Extension Opportunities

A presentation was made to the Rocky Mountain School District which outlined extension opportunities the District was prepared to provide school students focusing on the pilot project. Extension has been ad hoc on an invitational basis since.

3.3.5 Extension to Practitioners

The Pilot Project Co-ordinator and Working Group members have participated in over 35 extension opportunities directed at forestry practitioners as they've arisen. As well, the EFMPP Working Group has held annual workshops to present and update MOF and licensee staff, and other practicing foresters with activities ongoing in the pilot.

4.0 Ongoing Monitoring and Reporting of Performance Measures

As part of the EFMPP terms of reference, the Invermere Forest District committed to long-term monitoring of the pilot project in order to assess the success of the strategies/principles proposed in the study area and to observe research trials that were implemented. As proposed by the provincial Steering Committee, a "benchmarking" approach is being used that outlines the project goals and tracks achievement of those goals through the use of performance measures. The monitoring results are to be reported annually in a "Pilot Project Implementation Progress Report".

The goals established for the EFMPP encompass all the elements of sustainability (economic, environmental and social). These are;

Environmental
- Maximize forest productivity
- Optimize biological effectiveness
- Operationalize (implement) strategies within the Kootenay-Boundary Land Use Plan and Forest Practices Code

Economic
- Optimize economic efficiency
- Quantify economic benefits
- Empower local forest managers
- Coordinate with the Nelson Region AAC Mitigation Strategy

Social
- Optimize positive impacts on the community
- Involve the public in the development of the strategy

The various performance measures selected to track achievement of the above goals met the following characteristics;
- they support the project strategy
- they show trends
- they include targets that promote continuous improvement
- they contain both leading (performance drivers) and lagging (outcomes) measures
- they are balanced (i.e. not all economic, environmental, etc.)
- they are easily measured with current systems

Table 2 provides the framework that will be used for reporting the EFMPP's success in progressing towards the goals that have been set.

Table 2. EFMPP Goal Performance Measures Framework

Project Goal	Activities	Performance Measures	Target & Acceptable Range	Data Source/ Definition	Frequency of Reporting
Maximize forest productivity	• Undertake computer analyses to test different strategies • Support innovative field projects & initiatives • Implement proven mgmt. practices into operations	**Leading:** 1. Area of stands spaced	1. 800 ha (350 - 800)	1. ISIS	1. Annually
		2. Area of stands fertilized	2. 500 ha (0 - 500)	2. ISIS	2. Annually
		3. Area of FEN's and old growth stands partially harvested in MS & IDF	3. 300 ha	3. Annual report by Licensees & SBFEP	3. Annually
		4. Area of NDT4 ecosystem restored	4. 500 ha (150 - 500)	4. ISIS	4. Annually
		Lagging: 1. Average regen delay	1. 3 years	1. ISIS/Field Recce	1. Annually/5 years
		2. Backlog planting completed	2. 150 ha (75 - 150)	2. ISIS	2. Annually
Optimize biological effectiveness	• Support & monitor progress of ongoing research projects & give consideration to new proposals that meet pilot objectives • Ensure results are reported on a timely basis	**Leading:** 1. Carry out field trials & initiate new research	1. All ongoing field trials successfully completed	1. Completed research summaries submitted	1. Ongoing
		Lagging: 1. Extend results incl. recommendations on timing, location & intensity of mgmt. practices	1. Technical reports for each trial completed and distributed	1. Published technical reports	1. Ongoing
Operationalize strategies	• Hold download sessions for district and licensee staff • Receive endorsement from the Steering Committee & public involvement group • Add reference to EFMPP strategies in FDP Letter of Instruction to Licensees	**Leading:** 1. EFMPP strategies implemented within 3 years of commencing pilot	1. 3 years (3 - 5)	1. District FDP Instruction Letter	1. 2000 EFMPP Implementation Progress Report
		Lagging: 1. EFMPP strategies incorporated in Licensee FDP's	1. Strategies documented in FDP's	1. FDP's	1. Annally
		2. Chief Forester recognizes pilot strategies as "current practice" for TSR2	2. Chief Forester recognizes in writing	2. Written direction	2. Upon receipt
Quantify economic benefits	• Use Technical Advisory Committee to quantify economic benefits of pilot strategies • Provide timber supply analysis data to economists Use the Woodstock model to optimize silviculture treatments	**Leading:** 1. Socio-economic analysis of the pilot strategies undertaken	1. SEA completed	1. SEA document	1. Upon receipt
		2. Woodstock analyses undertaken	2. Silviculture Strategic Plan completed	2. Plan document	2. Upon receipt

Involve the public in the strategy development	• Prepare a formalized communications plan • Strike a public group to provide focused input • Respond on all public requests for information and presentations	**Leading:** 1. Public Involvement/ Communication Plan prepared 2. Public Advisory Group struck 3. Public involvement process implemented with information transfer on a regular basis	1. Plan completed & implemented 2. Group members in-place & meeting 3. Public has been approached. Presentations made.	1. Plan document 2. Meeting minutes 3. File records of letters, news articles and presentations made	1. Upon receipt 2. Annually 3. Annually

5.0 Financial Tracking - 1996/97 to 2002/03

The following Table 3 presents the previous and proposed budgets for the Invermere EFMPP specific to projects undertaken and applicable administrative costs.

Table 3. Invermere EFMPP Budget 1996/1997 to 2002/2003

Activity	1996/1997	1997/1998	1998/1999	1999/2000	2000/2001	2001/2002	2002/2003
General Administration	$317,500	$277,050	$59,700	$2,500	$2,500	$2,500	$1,000
(incl. data & computer enhancements)							
Travel and Training	$20,000	$20,000	$10,950	$6,500	$4,500	$4,500	$3,000
Extension	$16,500	$16,500	$17,650	$6,500	$6,500	$4,500	$3,000
Sub-Total	**$354,000**	**$313,550**	**$88,300**	**$15,500**	**$13,500**	**$11,500**	**$7,000**
Field and Analysis Projects							
UWR Analysis	$15,000	$6,000					
Post Harvest Old Growth Attribute Research	$32,000	$94,000	$89,000	$79,000	$52,000	$40,000	$40,000
Cruise Data Analysis	$1,500	$19,000	$4,000	$4,000			
Riparian Mapping	$8,000						
Forest Ecosystem Network Mapping							
Landscape Fire Patterns & Rates	$10,000						
Post-Fire Residual Stand Level Attributes	$10,000						
Crop Planning		$5,000					
Regeneration Delay and Green-up	$10,000						
Fertilization Trials	$5,000						
Genetically Improved Planting Stock							
Potential Problem Forest Types	$2,500						
Ecosystem Restoration Strategy	$3,000	$25,000	$5,000				
Viability of Problem Forest Types							
Growth Curve Adjustments							
Partial Cutting Growth & Yield Analysis	$2,000	$22,000	$9,100	$10,000	$9,500		
Data Metrification for FVS Modeling		$9,000					
Terrain Hazard Analysis							
Commercial Thinning Opportunities							
ESA Analysis							
Forest Health Inventory		$12,000					
Soil Conservation - LTSP			$40,000	$59,000	$65,000	$40,000	$30,000
- Root rot/soil disturbance	$10,000	$16,000	$80,000	$42,500	$5,000	$5,000	
- Soil Rehabilitation			$4,000	$10,000	$12,000		
- Nutrients & Tree Growth			$41,000	$40,000	$28,000	$20,000	
Forest Health Growth & Yield Modeling	$5,000						
Unsalvaged Losses Analysis		$5,000					
Archaeological Predictive Model			$17,700	$16,500			
East Kootenay Songbird Project - Fire & Harvest		$20,000	$20,000	$20,000			
FSSIM/SIMFOR Modeling Habitat Analysis			$68,000	$52,000	$50,000		
Goshawk Habitat Preference and Management			$23,000	$23,000			
Backlog NSR							
Sub-Total	**$114,000**	**$233,000**	**$400,800**	**$356,000**	**$221,500**	**$105,000**	**$70,000**
Total	**$468,000**	**$546,550**	**$489,100**	**$371,500**	**$235,000**	**$116,500**	**$77,000**

6.0 EFMPP Projects for 2002/03

Two long-term operational research projects will continue in the 2002/03 fiscal year. Detailed project descriptions of each follows.

EFMPP Activity Name: ***Post-Harvest Old-Growth Stand Attribute Research***

Initial goals of the activity:

- To compare partial harvesting effects on old-growth attributes and investigate the use of harvested old growth stands by wildlife species in the Interior Douglas-fir and Montane Spruce biogeoclimatic units.
- To evaluate the functional values of old-growth for wildlife species using old-growth attributes such as large trees, snags and down logs.
- To examine partial harvesting prescriptions with respect to their suitability for application within old-growth stands and recommend modifications as determined by the research results.
- The project (called POGSAR) involves the establishment of permanent old growth ecosystem plots for post-partial harvest re-measurement and future tracking of stand attribute change (using cavity nesters as the indicator species) and ecosystem disturbance/survival.

What has been done to date to meet the goal:

- Year 1 (1996/97) the research sites were selected with treatments assigned.
- Year 2 (1997/98), as guided by the project Work Plan, work activities included; establishment of a grid of sampling plots in each treatment unit, development of the harvesting prescription with licensee, collection of pre-treatment data (mensuration, wildlife, site, soil & vegetation), harvesting of the IDF unit, re-establishment of IDF plots post-harvest, data analysis, production of a progress report & presentation of a seminar for staff.
- Year 3 (1998/99), the first 4 of 8 harvested blocks were remeasured, the remaining 4 blocks to be harvested during the winter were also measured, harvesting of the MS unit, data was analyzed and a progress report was produced and published. The data was made available to the "SIMFOR project" also underway in the pilot.
- Year 4 (1999/00), work activities included; the re-establishment of MS plots post-harvest, the collection of post-treatment data from all sites, data analysis, production of a progress report for publication and a seminar for staff presenting results.
- Year 5 (2000/01), monitoring of the MS unit installations continued including the collection, analysis of data and reporting.
- Year 6 (2001/02), the last year of monitoring of the IDF unit installations was undertaken including collection and analysis of data and subsequent reporting. A publication, "Preliminary Operational Guidelines for Retention of Stand Structure in Old Seral IDF and MS Stands" was produced and distributed.

Current status of the project and extension (% complete compared to initial goal):

- Project is now 95% complete. The budget requested for 2002/03 is $40,000.
- One project report has been published "Impacts of Partial Cutting on Old-Growth Forests in the Rocky Mountain Trench: Interim Report" in November, 1998 and a second (as noted above) was produced during October, 2001.
- Three staff/industry presentations have been made relating recent results and operational implications.

What are the next steps – when will the project be complete:

- Installation monitoring of the MS unit will occur in 2002/03. This will be the last year of field work after which a final project report will be prepared and published.

Transferable learnings/processes:

- Project findings will be operationally applicable throughout the province where similar old-growth stand types and species guilds (cavity nesters) occur. They are of direct and immediate relevance to the Invermere Forest District and the remainder of the East Kootenay region for harvest planning.

EFMPP Activity Name: ***Managing Calcareous Soils in the B.C. Interior for Forest Productivity***

Initial goals of the activity:

- The primary goals of the project are;
  - to increase the level of knowledge of management effects on calcareous soils and
  - to provide operationally relevant guidance to field managers to minimize possible negative and maximize possible positive effects on soil productivity.
- In achieving these goals, specific areas (components) of focus include;
  - a long-term soil productivity trial on compaction and organic matter depletion,
  - an investigation into the effects of root removal treatments and alternative biological control treatments,
  - assessing a variety of techniques for rehabilitating disturbance and,
  - documenting the effects on tree growth and nutrition.
- The project is an "integrated forest soils project" involving several proponents and inter-related research trials.

What has been done to date to meet the goal:

Component 1: **Soil Compaction & Organic Matter Effects on Productivity (Long-term Soil Productivity Trial)**

- Year 1 (1998/99), the first installation at Mud Creek was successfully laid out with soil sampling complete. Harvest prescription was completed, cruise plots and reference trees were completed. Literature review, soil chemistry work, and tree growth and soil biology work completed. A seminar was provided to staff.
- Year 2 (1999/00), the first installation was successfully treated. Soil compaction and organic material removal treatments were completed and additional "mini" plots in co-operation with CFS and CFI were installed to look at the effects of compaction and scalping on calcareous subsoils and to relate the results from the larger plots to more operational disturbance sizes. Planting of seedlings is scheduled for the spring of 2000. The Emily Creek installation (replicate #2) was located and established. Soil and vegetation data was collected and is being collated. The silviculture prescription is being developed and GPS mapping is underway. Harvesting should be complete prior to fiscal year end.
- Year 3 (2000/01), compaction and organic matter treatments have been completed at Emily Creek site (2nd replicate). The third and final LTSP replicate in the lower Lussier area was laid out and subsequently harvested during the winter of 2000
- Year 4 (2001/02), compaction and organic matter treatments have been completed at Kootenay East site (3rd and final replicate). Monitoring of the Mud Creek and Emily Creek sites occurred across all facets of the various research components being investigated. Agencies involved in distinct research trials include the MOF, CFS, USFS, and U of C.

Component 2: **Root Rot/Soil Disturbance/Biocontrol Operational Trials**

- Years 1 & 2 (1996/97 & 1997/98), a research site was installed at Whitetail Brook. One establishment report was published on the findings as related to disturbance levels with a second to be published by fiscal year end 1999/00.
- Year 3 (1998/99), a second installation at Nine Mile Creek was harvested testing a dry harvest approach that industry (Slocan) feels may save up to $4/cubic metre. Soil disturbance and compaction surveys were analyzed with unpublished reports posted on the pilot webpage. Hypholoma was planted on the last block at Whitetail Brook and at the Nine Mile Creek block. Monitoring of the 1998 Hypholoma plantings found successful early results. Cooperative study on Armillaria was initiated with CFS, Edmonton to complement existing cooperation with Pacific Forestry Station. A seminar was provided to staff.
- Year 4 (1999/00), wet site harvesting and destumping was completed at Nine Mile Creek and soil analysis has been completed. Hypholoma was planted on the wet harvesting site bringing to a total of 5 blocks in the pilot where Hypholoma has been established under different harvesting treatment regimes.
- Year 5 (2000/01), Hypholoma was in the assessment and reporting phase with monitoring ongoing on the soil disturbance plots. An interim report was published and distributed as an extension note.
- Year 6 (2001/02), assessments of the Hypholoma treatments were carried out.

Component 3: **Rehabilitation of Disturbance**

- Year 1 (1998/99), a very "clayey" skidtrail was successfully rehabilitated adjacent to the harvesting root rot/soil disturbance operational trial at Whitetail Brook. In addition, Research Branch worked with SBFEP on new landing trials to investigate cost-effective ways of restoring productivity. An interim report was prepared by fiscal year end 2000/01.
- Year 2 (1999/00), less work was required in this component. The very clayey skidtrail that had been successfully rehabilitated at Whitetail Brook was revisited to confirm that the rehabilitation has been successful and did not recompact over winter. New SBFEP landing trials were planted with monitoring by Research Branch. A draft Extension Note was prepared outlining a protocol for establishing and monitoring this inexpensive approach to rehabilitation adaptive management. Tree growth on some old landings and borrow pits was measured to provide a "worst case scenario" baseline. An interim report was prepared on the borrow pit trees and is under review. An Extension Note was published on landing rehabilitation interim results and included the landings measured above.
- Year 3 (2000/01) works included monitoring work and documenting results from the LTSP and monitoring seedling response on rehabilitated sites elsewhere.
- Year 4 (2001/02), monitoring of rehabilitated sites was undertaken. Additional plots were installed at Whitetail Brook to monitor long-term success of regeneration on disturbed areas.

Component 4: **Soil Nutrients and Tree Growth Relationship**

- Year 1 (1998/99), a number of provenance trials were sampled for soil properties with follow-up foliage sampling. A good range of depth to carbonates was found and provenances/progenies have been chosen based on local source and tree performance (good and poor) to determine if there is a relationship between growth and/or seed origin and calcareousness. A literature review was completed and with a summary produced, plus a report on the findings from sampling. Note: fertilization trials previously initiated under the pilot have been absorbed by this component.
- Year 2 (1999/00), detailed soil sampling occurred on two 25 year old progeny sites in non-calcareous soils as a comparison to calcareous sites already sampled. Sample preparation and analysis will begin in the fall and continue through to the end of the fiscal year. An experimental design was developed to assess the effect of depth to carbonates and compaction on tree growth in the Mud Creek long-term soil productivity trial. Installation of the research plots was completed.
- Year 3 (2000/01) works included plot establishment at Emily Creek site, seedling planting at the Mud Creek site, monitoring work and documenting results from the Mud Creek site, lab work and reporting on the overall retrospective work that was investigated at other sites in the pilot.
- Year 4 (2001/02) work led by CFS involved the monitoring and documenting of results from the Mud Creek and Emily Creek LTSP sites, followed-up by subsequent lab work and reporting.

Current status of the project and extension (% complete compared to initial goal):

- Component 1 is now 90% complete. The budget requested for 2002/03 is $30,000. Three staff/industry presentations have been made relating early results and operational implications. An international presentation was made in New Orleans in October, 2000. Two refereed journal articles will be published by year-end. An establishment report will be published jointly by MOF and CFS by fiscal year-end. Several field trips were conducted in 2001 to the LTSP installations to discuss early results with district, licensee and USFS staff. Several new projects have been initiated at the LTSP's by researchers from the USFS, Michigan Tech and the U of C focused on other issues arising from calcareous soils.
- Component 2 is now 95% complete. A project report "Harvesting Options in Highly Constrained IDF Stands in the Rocky Mountain Trench: Interim Report" was published in May, 1998. Two additional interim reports relating to the analysis results from soil compaction and disturbance were published in 2000. A report on the biocontrol of Armillaria through the use of Hypholoma was published in March, 2001. Two formal staff/industry presentations have been made relating early results and operational implications. A number of field trips have been conducted with MOF and licensee staff. No budget has been requested in 2002/03, monitoring will be conducted in-house.
- Component 3 is now 95% complete. There is no budget requested for 2002/03. An interim project report has been prepared and published. An earlier Research Branch "Extension Note" on landing rehabilitation was published. One staff/industry presentation has been made relating early results and operational implications.
- Component 4 is now 95% complete. There is no budget requested for 2002/03, works will be conducted in-house by CFS staff. A CFS Extension Note establishment report has been published. A second project report relating a literature review on calcareous soils research was published in June, 2000. One staff/industry presentation has been made relating early results and operational implications. An extension note relating the results from the assessment of the provenance trials will be published by fiscal year end.

What are the next steps – when will the project be complete:

Component 1:

- LTSP plots must be established at the third replicate, Kootenay East site. First year monitoring at Emily Creek and second year monitoring at Mud Creek will be completed. This will be the last year of funding for this component from an EFMPP perspective after which the Nelson Forest Region Research Section will assume responsibility for long-term monitoring and reporting.

Component 2:

- The last year of funding for this component from an EFMPP perspective was 2001/02. A collaborative team involving the MOF, industry and the CFS have assumed responsibility for long-term monitoring and reporting.

Component 3:

- The last year of funding for this component from an EFMPP perspective was 2000/01. Research staff from Branch and Regional levels of the MOF have assumed responsibility for long-term monitoring and reporting.

Component 4:

- The last year of the component from an EFMPP funding perspective was 2001/02. A collaborative team involving the MOF and CFS have assumed responsibility for long-term monitoring and reporting.

Transferable learnings/processes:

- The installation of long-term soil productivity trials will create a replicated research site that will, after time, generate operational results for direct application in day-to-day harvesting operations. The project findings detailing the impact of soil compaction and the removal of organic matter on calcareous soils add to the general body of knowledge around soil conservation and will have applicability where similar soil types occur in the province. As well, the trial protocols complement the existing world-wide network of Long-term Soil Productivity Trials giving additional credibility and extension opportunity of the results.
- Operational trials related to root rot and soil disturbance in calcareous soil situations is a new research area. The analysis approach being employed is unique and the key learnings are transferable to areas with similar soil types in the province. The results from the root rot bio-control work with Hypholoma will complement a handful of similar trials underway in the province and will add to the volume of knowledge related to root rot control measures. The potential positive impacts across the province are significant both environmentally and economically in Hypholoma is found to be cost-effective.
- Project results from the soil rehabilitation project will have direct on day-to-day operational harvesting and post-harvesting activities and will have applicability where similar soil types occur in the province.
- The relationship of soil nutrients to tree growth is an area of substantial research. The pilot results will add to the limited body of knowledge regarding growth effects in calcareous soils and will have applicability where similar soil types occur in the province.